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EXAMINER	
STERRETT, JONATHAN G	

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,963	TANG ET AL.	
	Examiner	Art Unit	
	Jonathan G. Sterrett	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-76* is/are pending in the application.

4a) Of the above claim(s) *16-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 32-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1-29-02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Summary

1. **Claims 1-76** are pending in the application. Claims **1-15 and 32-76** were elected by the applicant. Claims 16-31 are withdrawn. This action is responsive to the election of July 7, 2006. The examiner notes that these claims were elected without traverse. The examiner appreciates the applicant's comments regarding the examiner's kindness and helpfulness during the telephone discussion on July 5, 2006.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 3, 34 and 50-76** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding **Claims 3 and 34**, the limitation is cited "wherein each of the tasks includes a mandatory portion and an optional portion". The specification describes the use of the invention to schedule the transmission of data packets over a network. It is known in the art that a data packet is a unit of data transmission which contains addressing information (e.g., to: and from:) as well as other information necessary for a

computer to reassemble the data packets upon receipt according to a particular arrangement. Splitting up each data packet into a "mandatory" and "optional" portion would result in partial data packets existing, with a part of the data packet potentially without the necessary address/ reassembly information. It is not clear how one of ordinary skill in the art would schedule a split data packet where the data packet might contain some information, but not other information (e.g. address) such that the data packets could be rearranged at a final destination such that the end message could be composed. Therefore, the claims, as cited, are not enabled. (The examiner suggests changing the wording to "wherein each of the group of tasks includes a mandatory and an optional portion" to overcome this rejection).

Claims 50-76 depend on Claims 3 and 34 and are not enabled at least for the reason(s) cited above for claims 3 and 34.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "task" in **claims 1-32** and **32-76** is used by the claim to mean

"electronic data packets", while the accepted meaning is "an assigned piece of work." The term is indefinite because the specification does not clearly redefine the term.

Claim Rejections - 35 USC § 102

x. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

x. **Claims 1 and 32** are rejected under 35 U.S.C. 102(b) as being anticipated by **Tang**, Ming-Chung; Chang, R.C.; Shih, Wei-Kuan; "Software Radio System Design for Accessing Wireless Multimedia Services", Dept of Computer Information Science, National Tsin-Hua University, Taiwan, pp.1-12. (hereinafter **Tang**).

Regarding claim 1, Tang discloses:

a regulator for receiving a plurality of tasks for the apparatus;

Figure 4, page 4 illustrates a regulator for receiving a plurality of tasks (denoted as M_1O_1 to M_nO_n)

an on-line scheduler, coupled to the regulator, for selecting a real-time scheduling method and receiving a number of the tasks,

Figure 4, page 4 illustrates an online scheduler that is coupled to the regulator. The online scheduler selects a real-time scheduling method and receives a number of tasks – see also page 6 para 1.

wherein the number of the tasks which are inputted to the on-line scheduler are adjusted by the regulator, and the on-line scheduler, according to the real-time scheduling method, is to configure time intervals for inputted tasks to be executed; and

page 6, para 1, the tasks inputted to the online scheduler are adjusted by the regulator (note Figure 4 with the suspended/discarded tasks). The tasks are scheduled according to the method (MOS, MOP or MOF)

an evaluator, coupled to the regulator and the on-line scheduler, for evaluating a scheduling result of the on-line scheduler, feeding a first set of parameters into the regulator for a coarse adjustment, and feeding a second set of parameters into the on-line scheduler for a fine adjustment.

Figure 4, the evaluator evaluates the result of the online scheduler and feeds a first set of parameters into the regulator for a course adjustment (see Figure 4) and feeds a second set of parameters into the online scheduler for a fine adjustment. See also page 6 para 1.

Claim 32 recites limitations similar to those addressed by the rejection of **Claim 1** above, and is therefore rejected under the same rationale.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 1, 3-15, 32, and 34-76** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Das**, S.K.; Jayaram, R; "A call admission and control scheme for quality-of-service (QoS) provisioning in next generation wireless networks", 2000, Wireless Networks, 6, 1, ABI/INFORM Global, p.17, (hereinafter **Das**).

Regarding **Claim 1**, Das teaches:

a regulator for receiving a plurality of tasks for the apparatus;

Figure 2, traffic packets (i.e. tasks) are received and controlled by the admissions controller

an on-line scheduler, coupled to the regulator, for selecting a real-time scheduling method and receiving a number of the tasks,

Figure 2, the call control block determines whether real time or non real time tasks are scheduled. The call control block is coupled to the regulator to schedule packets.

wherein the number of the tasks which are inputted to the on-line scheduler are adjusted by the regulator,

page 19 column 2 para 3, the tasks entering the system are allowed to enter by the admissions controller

and the on-line scheduler, according to the real-time scheduling method, is to configure time intervals for inputted tasks to be executed; and

Figure 2, the call control block schedules tasks based on the time intervals allowed (see page 20 column 1 para 2, depending on real or non-real time packets and the associated timing available, the call control block determines how packets are scheduled).

an evaluator, for evaluating a scheduling result of the on-line scheduler, feeding a first set of parameters into the regulator for a coarse adjustment, and feeding a second set of parameters into the on-line scheduler for a fine adjustment.

Page 20 column 1 para 4, a course set of parameters are used to determine whether and which packets get discarded (e.g. real time vs non-real time) and a fine set of parameters is used to determine compaction of the scheduled time interval for packet transmission – see page 20 column 2 para 2).

Das teaches the regulation, scheduling and evaluator functions described above but does not teach a second evaluator that is coupled to the regulator and online scheduler.

However, it is old and well known in the art to make devices separable that are integral (see - Nerwin v. Erlichman, 168 USPQ 177, 179 (BdPatApp&Int 1969); In re Dulberg, 129 USPQ 348, 349; 289 F.2d 522 (CCPA 1961))

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Das, regarding having an integral scheduler and evaluator, to make the scheduler and evaluator separate.

Regarding **Claim 3**, Das teaches:

wherein each of the tasks includes a mandatory portion and an optional portion, and the fine adjustment is performed by controlling a proportion of the optional portion to be executed.

Page 20 column 2 para 4, packets (i.e. tasks) include a real time (i.e. mandatory) and non real time (non-real time) packets. The real time portion of the packets is controlled by the scheduler depending on the bandwidth (lower bandwidth available means that the mandatory packets must be transmitted to preserve the real time nature of the media being transmitted – see page 19 column 2 para 1). – see page 21 column 1 para 4, fine adjustment allows for optional (i.e. non real time packets) to be scheduled in with the real time – see Figure 4 on page 21 for an illustration of this).

Regarding **Claim 4**, Das teaches:

wherein the regulator adjusts the number of the tasks inputted to the on-line scheduler according to the first set of parameters.

Page 20 column 1 para 4, the regulator adjusts the number of packets allowed to enter according to the course set of parameters (i.e. the first set controls the amount of

real time vs non real time; if there's too much of a demand on capacity, the non-real time packets are dropped).

Regarding **Claim 5**, Das teaches:

wherein the on-line scheduler selects the real-time scheduling method according to the second set of parameters.

Figure 4 & page 21 column 2 para 1, the call control block controls the compaction of real and non-real time packets (i.e. the compaction algorithm – see Figure 4 for a before and after view of the spectrum after packet compaction).

Regarding **Claim 6**, Das teaches:

wherein the real-time scheduling method is a scheduling method in which the mandatory portions of the inputted tasks are executed as soon as possible and the optional portions of the inputted tasks are substitutable (MOS method).

Page 21 column 1 para 3, bandwidth compaction allows for substitutable non critical (non real time packets) into the spaces between the critical real time packets (the real time packets have to be transmitted (i.e. executed) as soon as possible to preserve the real time latency requirements.

Regarding **Claim 7**, Das teaches:

wherein the real-time scheduling method is a scheduling method in which the mandatory portions of the inputted tasks are executed as soon as possible

and the substitutable optional portions of the inputted tasks are postponed (MOP method).

Page 21 column 1 para 3, bandwidth degradation (gradual loss of service for non-critical packets) provides for the optional, packets to be postponed. – see also page 21 column 2 para 1 – the amount of bandwidth allocated (i.e. scheduled) to non-real-time applications decreases, thus those packets are postponed. – see also page 19 column 2 para 1 – temporary buffer for non-real time packets.

Regarding **Claim 8**, Das teaches:

wherein the real-time scheduling method is a scheduling method in which the mandatory portions of the inputted tasks are executed as soon as possible

as discussed above, to preserve real time traffic.

Das does not teach using the approach known in the art for managing traffic according to a fair algorithm.

However, it is old and well known in the art for mandatory (real time) and optional (non-real time) to be scheduled according to a weighted average or fair algorithm. This ensures a more even balance between a high demand for non real time traffic and low demand for real time traffic so that the real time does not completely exclude the non-real time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the scheduling teachings of Das, regarding scheduling of mandatory (real time) and optional (non-real time) packets, to include the step of using a weighted average approach to schedule the two types of packets (i.e. tasks) fairly, because it would ensure a fair balance between the mandatory (real time) and optional (non-real time) data traffic.

Regarding **Claim 9**, Das teaches:

wherein the evaluator evaluates the scheduling result of the on-line scheduler according an evaluation standard, and the evaluation standard includes a task rejection rate,

page 22 column 1 para 3, the QoS (Quality of Service) monitoring function provides feedback to the scheduler based on number of handoff drops (i.e. rejection rate)

a task suspend/discard rate,

interference level (i.e. causing a packet to be suspended).

an idle rate,

page 22 column 1 para 2, the level of inactivity in a cell is monitored.

and a slack time.

As discussed above for compaction, the slack time between mandatory packets (i.e. tasks) is used to determine how non mandatory packets are scheduled, as part of the compaction algorithm.

Regarding Claims 10 and 11, Das teaches scheduling for optimized packet transmission in a network but does not teach where scheduling parameters utilize a token generation rate, as per Claim 10 and a token number, as per Claim 11.

However, as noted in the specification, the use of tokens (including a generation rate and number) in scheduling packet transmission is old and well known in the art of packet transmission scheduling. This technique is a proven and reliable technique for packet transmission.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the scheduling teachings of Das, regarding scheduling of mandatory packets, to include the step of using a token generation rate, as per Claim 10, and a token number, as per Claim 11, because the token approach to packet transmission provides a reliable and proven way to provide scheduling of packet transmissions.

Regarding **Claim 12**, Das teaches:

wherein the first set of parameters includes a queue length.

Page 19 column 2 para 1, the amount of packets that are awaiting transmission affects the course adjustment (i.e. the balance between real time and non real time transmission). Thus the queue length of packets awaiting transmission affects how many non-real time packets are either buffered (i.e. delayed further) or dropped.

Regarding **Claim 13**, Das teaches:

wherein the second set of parameters includes a real-time scheduling selection parameter.

Page 21 column1 para 3, channel borrowing is a real time scheduling selection parameter in that other, available channels are checked to determine if they can be 'borrowed', i.e. selected, for overflow bandwidth for real time transmissions.

Regarding **Claim 14**, Das teaches:

wherein the second set of parameters includes a substitutable check parameter.

Page 21 column 2 para 5, the partial bandwidth compaction algorithm performs a check on the spectrum to determine if moving a few bandwidth segments to adjoining holes (again see Figure 2), if enough bandwidth can be freed up to satisfy the user's request.

Regarding **Claim 15**, Das teaches:

wherein the second set of parameters includes a parameter indicative of a maximum allowable execution proportion of the optional portion.

Page 21 column 2 para 2, the bandwidth compaction algorithm includes the parameter of finding non real time packets that are smaller than the available "holes"

(see Figure 2 on page 21) – thus the maximum allowable parameter includes finding NRT packets smaller than the 'holes'.

Claims 16-32 and 35-76 recite limitations similar to those addressed in the rejection of **Claims 1 and 3-15** above and are rejected under the same rationale.

Regarding **Claim 34**, Das teaches where in cases there is excessive bandwidth, the number of non real time (i.e. optional) tasks to be allowed to enter the system (i.e. the course adjustment as adjusted by the regulator) is determined by parameters fed by the downstream evaluator (see page 20 column 1 para 2, here there are two different types of tasks, and thus queues – see page 22 column 1 para 1 for a discussion how the course adjustment is set by the downstream evaluator).

8. **Claims 2 and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Das** in view of **Bragg**, Arnold: "Quality of Service, Old Idea, New Options", Sep-Oct 1999, IT Pro, 1999 (C) IEEE, pp.37-44, (hereinafter **Bragg**).

Regarding Claim 2, Das does not teach where the regulator, scheduler and evaluator are hardware devices per se. Regarding Claim 33, Das does not teach where the regulator, scheduler and evaluator are software devices per se.

However, it is old and well known in the art for these functionalities to be provided as either hardware or software devices, as taught by Bragg (see page 38 sidebar "How Queue Management Works", line 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a regulator, scheduler and an evaluator as a hardware device, as per Claim 2, as a software device, as per Claim 33, because it would most effectively provide the appropriate QoS functionality dependent on the implementation scheme, as taught by Bragg.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fotedar, Shivi, Gerla, Mario, Crocetti, Paola, Fratta, Luigi, "ATM virtual private networks", Feb 1995, Association for Computing Machinery. Communications of the ACM. New York:.Vol.38, Iss. 2; pg. 101, 9 pgs.

Mahadevan, Indu; Sivalingam, Krishna M; "Architecture and experimental results for quality of service in mobile networks using RSVP and CBQ", 2000, Wireless Networks; 6, 3, ABI/INFORM Global, p.221,

Anastasi, G; Lenzini, L; "QoS provided by the IEEE 802.11 wireless LAN to advanced data applications: a simulation analysis", 2000, Wireless Networks, 6, 2, ABI/INFORM Global, p.99.

Greenfield, David; "IP Services: The next generation", Dec 1999, Network Magazine, 14, 12; ProQuest Computing, p.82.

Kado, Youiti; Ishida, Hiroshi; Yajima, Yoshiyuki; "Quality-of-Service guarantees architecture with weighted fair shaping", 2000, Telecommunication Systems, 15, 1-2, ABI/INFORM Global, p.145.

Jorgensen, Jacob; "QoS for wireless broadband access", Aug 2000, Telecommunications, 34, 8, ABI/INFORM Global, p.86.

Kumar, Praveen; "Issues in implementing queuing and scheduling for high performance routers", Oct 26, 2000, 45, 22, ABI/INFORM Global, p.127.

Ros, David; Marie, Raymond; "Loss characterization in high-speed networks through simulation of fluid models", Jan 2001, 16, 1-2, ABI/INFORM Global, p.73.

White, Gerry; "QoS: Enabling multiple services on cable networks", Oct 2000, Telecommunications, (Americas Edition) Dedham, Vol. 34, Iss. 10, pg. 94, 2 pgs,

ProQuest ID 62765614.

Kaufman, David, "Delivery Quality of Service on the Internet", Feb 1999, Telecommunications, 33, 2, ABI/INFORM Global, p.35.

Lu, Songwu; Nandagopal, Thryagrajan; Bharghavan, Vaduvuy; "Design and analysis of an algorithm for fair service in error-prone wireless channels", 2000, Wireless Networks, 6, 4, ABI/INFORM Global, p.323.

Passmore, David; "No Ironclad guarantees", Oct 1998, Business Communications Review, v28, n10, p.26(2), Dialog 10652477 21276365.

Vaughn, Chris; "QoS delivered with ATM Edge Service", Oct 19, 1998, Electronic Engineering Times, 76(1), Dialog 10540249 53095901.

Malcolm, Nicholas; Makarechian, Mohammad; "Traffic Cops: proper testing of policing function will be critical to ensuring ATM quality of service", Aug 18, 1997, Telephony, v233, n7, p40(4), Dialog 09757205 19798731.

US 5850399 A by Ganmukhhi discloses a hierarchical packet scheduling method and apparatus.

US 5418777 A by Worster discloses a modified leaky bucket approach for

message transmission.

US 5448567 A by Dighe discloses a control architecture for ATM networks.

US 5541913 A by Witters discloses a transmission policing device.

US 5625622 A by Johri discloses an apparatus and method for a leaky bucket technique for data transmission.

US 6014384 A by Weberhofer discloses a method for controlling data traffic in an ATM network.

US 6167050 A by Chung discloses traffic control for an ATM network.

US 6226265 B1 by Nakamichi discloses a packet flow control and monitoring system.

US 6259696 B1 by Yazaki discloses an ATM switch and congestion control method.

US 6532213 B1 by Chiuzzi discloses a method for scheduling in a packet network.

US 6757249 B1 by Kejriwal discloses a method for control in a packet pipeline.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan G. Sterrett whose telephone number is 571-272-6881. The examiner can normally be reached on 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 571-272-6729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JGS

JGS 9-28-2006

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